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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,257	12/19/2001	Akira Chinda	035532-0118	7027

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 11/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/021,257

Applicant(s)

CHINDA ET AL.

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 37-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Pre-amendment A filed on 12/19/01 has been fully considered and made of record in Paper No. 4.

Election/Restrictions

2. Applicant's election of claims 1-36 in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
3. Claims 37-49 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected claims, there being no allowable generic or linking claim.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on 12/19/01 in Paper No. 2 was filed before the mailing date of the non-final rejection on 11/24/02. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: " t " in Fig. 2. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " WIRING BOARD UTILIZING A CONDUCTIVE MEMBER HAVING A REDUCED THICKNESS ".

Claim Objections

8. Claims 1 and 12 are objected to because of the following informalities: the phrase " to be ", since the phrase implies that the function can or does not have to occur. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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10. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. In claims 1 and 12, the phrase "predetermined" is vague and indefinite since it is not clear what predetermined is referring to.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 12, and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the Admitted Prior Art.

With respect to Claims 1 and 12, the Admitted Prior Art teaches a conductive member 15 having a thickness from a surface on which the electric wiring 2 of the insulating substrate 1 has been disposed being thinner than that of the insulating substrate 1. The portion of the conductive member 15 that is thinner than the insulating substrate is where the ball terminal 16 first contacts the bottom of the conductive member 15 inside the opening 101 to where the conductive member 15 contacts the electric wiring 2 (see Fig. 1B).

With respect to Claim 14, the Admitted Prior Art teaches a semiconductor chip 6 that is placed in such that the external electrode 601 thereof is opposed to the opposed

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to the wiring board 1, wherein the external electrode is connected with the electric wiring 2 by means of a protrusion conductor 13 (see Fig. 1B).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 2-4, 14-16, 18-20, 22, 23 insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted Prior Art as applied to claims 1, 12, and 14 above, and further in view of Ishikawa (JP 2000-4069).

With respect to Claims 2-4, 15, 16, 18-20, 22, and 23, the Admitted Prior Art fails to disclose a thickness of the conductive member that is $\frac{1}{2}$ or more of that of the insulating substrate while the conductive member has a thinner thickness at the central

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portion of the opening than that of a vicinity of aside wall of the opening. However, Ishikawa discloses a thickness of the conductive member 3 that is $\frac{1}{2}$ or more of that of the insulating substrate 1, 7 while the conductive member 3 has a thinner thickness at the central portion of the opening 5 than that of a vicinity of aside wall of the opening 5 (see English abstract and figures). The Admitted Prior Art and Ishikawa have substantially the same environment with the substantially the same structure. Therefore, it would have been obvious to incorporate the conductive member with a thinner thickness at the central portion of the opening with the device of the Admitted Prior Art, since the conductive member would improve the adhesion between the conductive member and another electronic part as taught by Ishikawa.

16. Claims 5-11, 24, 25, 27-31, and 33-36, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted Prior Art-Ishikawa (JP 2000-4069) as applied to claims 1, 12, and 14 above, and further in view of Uzoh (U.S. 6,180,505).

With respect to Claims 5-11, 24, 25, 27-31, and 33-36, the Admitted Prior Art discloses a conductive member 15. The Admitted Prior Art-Ishikawa both fail to disclose a conductive member is made of copper (Cu) with a thin film layer made of nickel (Ni) and a thin film layer made of gold (Au) are sequentially disposed on a surface of the conductive member. However, Uzoh discloses a conductive member is made of copper (Cu) with a thin film layer made of nickel (Ni) 25 and a thin film layer made of gold (Au) 27 are sequentially disposed on a surface of the conductive member 10 (see col. 3 lines 62-67 and col. 6 lines 32-42). The Admitted Prior Art- Ishikawa and Uzoh

have substantially the same environment with the substantially the same structure.

Therefore, it would have been obvious to incorporate the conductive member made of copper (Cu) with a thin film layer made of nickel (Ni) and a thin film layer made of gold (Au) that are sequentially disposed on a surface of the conductive member with the device of the Admitted Prior Art-Ishikawa, since the conductive member structure would prevent destructive interaction between the nickel and copper as taught by Uzoh.

17. Claims 13, 17, and 21, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted Prior Art as applied to claim 12 above, and further in view of Kimbara et al. (U.S. 6,363,436) and Ishikawa (JP 2000-4069).

With respect to Claim 13, the Admitted Prior Art fails to disclose an external electrode of a semiconductor chip that is connected with the electric wiring by means of a bonding wire. However, Kimbara discloses an external electrode of a semiconductor chip "i" that is connected with the electric wiring "l" by means of a bonding wire "j". The Admitted Prior Art and Kimbara have substantially the same environment with the substantially the same structure. Therefore, one skilled in the art would readily recognize substituting wire bonding for a flip-chip method, since wire bonding is alternate method for flip chip when attaching a semiconductor chip to a substrate as taught by Kimbara.

With respect to Claims 17 and 21, the Admitted Prior Art-Kimbara both fail to disclose a thickness of the conductive member that is $\frac{1}{2}$ or more of that of the insulating substrate while the conductive member has a thinner thickness at the central portion of the opening than that of a vicinity of aside wall of the opening. However, Ishikawa

discloses a thickness of the conductive member 3 that is $\frac{1}{2}$ or more of that of the insulating substrate 1, 7 while the conductive member 3 has a thinner thickness at the central portion of the opening 5 than that of a vicinity of a side wall of the opening 5. The Admitted Prior Art-Kimbara and Ishikawa have substantially the same environment with the substantially the same structure. Therefore, it would have been obvious to incorporate the conductive member with a thinner thickness at the central portion of the opening with the device of the Admitted Prior Art, since the conductive member would improve the adhesion between the conductive member and another electronic part as taught by Ishikawa.

18. Claims 26 and 32 insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted Prior Art-Kimbara et al. (U.S. 6,363,436) as applied to claims 12 and 13 above, and further in view of and Uzoh (U.S. 6,180,505).

With respect to Claims 26 and 32, the Admitted Prior Art discloses a conductive member 15. The Admitted Prior Art-Kimbara both fail to disclose a conductive member is made of copper (Cu) with a thin film layer made of nickel (Ni) and a thin film layer made of gold (Au) are sequentially disposed on a surface of the conductive member. However, Uzoh discloses a conductive member is made of copper (Cu) with a thin film layer made of nickel (Ni) 25 and a thin film layer made of gold (Au) 27 are sequentially disposed on a surface of the conductive member 10 (see col. 3 lines 62-67 and col. 6 lines 32-42). The Admitted Prior Art-Kimbara and Uzoh have substantially the same environment with the substantially the same structure. Therefore, it would have been obvious to incorporate the conductive member made of copper (Cu) with a thin film

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layer made of nickel (Ni) and a thin film layer made of gold (Au) that are sequentially disposed on a surface of the conductive member with the device of the Admitted Prior Art-Ishikawa, since the conductive member structure would prevent destructive interaction between the nickel and copper as taught by Uzoh.

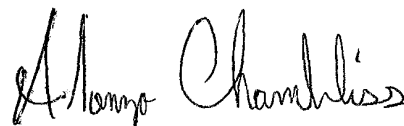
The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

19. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/November 24, 2002



Alonzo Chambliss
Examiner
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